In the Specification:

On page 31, line 19, please add the following new paragraphs:

Therefore, in one embodiment, the present invention may be practiced as a method of simulating a circuit, the method comprising steps for defining a differential-algebraic equation of the circuit, defining a simulation time interval corresponding to the differential-algebraic equation, and dividing the simulation time interval into time intervals. The time intervals may include corresponding polynomials for each time interval, wherein each polynomial is a portion of an approximation to a desired solution of the differential-algebraic equation, and the method includes the step of applying a collocation method to discretize the differential-algebraic equation. In the method, the simulation time interval has collocation points, and wherein the interpolating polynomial has a degree of M, and the approximation to the desired solution of the differential-algebraic equations is $I_M u(t) = \sum_{k=0}^{M} \tilde{u}_k T_k(t),$ wherein M is the highest degree of the interpolating polynomials.

The invention may also be described as a method of simulating a circuit, the method comprising the steps of defining a differential-algebraic equation of the circuit, defining a simulation time interval corresponding to the differential-algebraic equation, dividing the simulation time interval into time intervals, wherein the time intervals have corresponding polynomials for each time interval, wherein each polynomial is a portion of an approximation to a desired

solution of the differential-algebraic equation, and applying a collocation method to discretize the differential-algebraic equation. In the method, the simulation time interval has collocation points, and wherein the interpolating polynomial has a degree of M, the approximation to the desired solution of the differential-algebraic equations is $I_M u(t) = \sum_{k=0}^{M} \tilde{u}_k T_k(t),$ wherein M is the highest degree of the interpolating polynomials, and a derivative of the approximation is $(I_M u)'(t) = \sum_{k=0}^{M} \tilde{u}_k' T_k(t).$

In another embodiment, the present invention is a method of solving a set of differential-algebraic equations arising in a circuit simulation, the method comprising the steps of, applying a collocation method to each differential-algebraic equation to discretize the set of differential-algebraic equations; forming a solution to the set of differential-algebraic equations based on the discretized differential-algebraic equation, and determining an order of accuracy desired in each interval, wherein, the set of differential-algebraic equations comprises a set of boundary-value differential-algebraic equations, and wherein the boundary-value differential-algebraic equations are discretized in intervals, and wherein neighboring intervals share a boundary, and the solution in a particular interval is not smooth, and wherein the step of determining the order of accuracy desired in each interval comprises splitting the particular interval into at least two subintervals. The method may include that the set of differential-algebraic equations comprises a set of boundary-value differential-

algebraic equations, and the boundary-value differential-algebraic equations include a first and a last interval.

In yet another embodiment, the present invention is a computer-readable medium carrying one or more sequences of one or more instructions for solving a set of differential-algebraic equations arising in a circuit simulation, the one or more sequences of one or more instructions including instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of, applying a collocation method to each differential-algebraic equation to discretize the set of differential-algebraic equations, and forming a solution to the set of differential-algebraic equations based on the discretized differential-algebraic equation, wherein, the set of differential-algebraic equations comprises a set of boundary-value differential-algebraic equations, the boundary-value differential-algebraic equations are discretized in intervals, and wherein neighboring intervals share a boundary, the instructions further cause the processor to carry out the step of determining an order of accuracy desired in each interval, and the solution in a particular interval is not smooth, and wherein the step of determining the order of accuracy desired in each interval further causes the processor to carry out the step of splitting the particular interval into at least two subintervals. The computer-readable medium may include that the set of differential-algebraic equations comprises a set of boundary-value differential-algebraic equations, and the boundary-value differential-algebraic equations include a first and a last interval.